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ABSTRACT

Two games for introducing population-related concepts and understandings into the junior-senior high school curriculum are described in this document. Planafam I is a card game which utilizes role-play techniques. A primary purpose is to increase the student's personal awareness of social norms and biological constraints in fertility behavior. Players trace the entire reproductive lifespan of a couple from rural India, making decisions which influence their family size and composition. The teacher functions as a roving provoker of discussion, asking questions, keeping students within the framework of Indian culture, etc. Materials required are: a large piece of paper or cardboard; a marking pen; three decks of ordinary playing cards. Planafam II is a role-play simulation designed to help students and young adults span the gap between large scale and personal perspectives, and to facilitate consideration of factors involved in reproductive decision making at the personal/family level. The role player (part of a group numbering from 3-10) takes the role of a woman whose reproductive life provides the focus for the game. Materials needed are: a large piece of stiff white paper; three sets of double-six dominoes; two decks of playing cards; marking pens; and ordinary buttons. Complete instructions and suggestions for possible discussion are provided for the two games. (Author/JLB)

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PLANAFAM I

A Game for Population Education

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PLANAFAM

A Game for Population Education

Teachers at all grade levels are beginning to introduce population-related concepts into their courses. Educational materials are necessary for the teaching of this new subject matter.

In this article we shall describe a game, Planafam, which can be used by junior and senior high school teachers as a role-play exercise to facilitate student understanding of personal reproductive motivations, the relevance of these to population variables of a society, and the time span over which one's thinking must extend in considering population dynamics.

Background

Planafam, a card game invented by Dr. Harold Thomas, has been played with individuals and groups from various educational, religious, and socio-economic backgrounds, and ages from early teens to middle age. For the high school students, it has served as a powerful stimulus for discussion, and has provided a context in which the relationships between personal decisions and population dynamics can be explored by the group without threat to the student's maturity or the validity of his

sentiments.[1]

In a short time the player can trace the entire reproductive lifespan of a couple from rural India, making decisions which influence their family size and composition, and seeing how fate plays a strong influence as well. A primary purpose of the role-playing experience is to increase the student's personal awareness of social norms and biological constraints in fertility behavior.

In order to play the game, the player needs very little specific instruction. He must be familiar with a few ideas related to reproduction and fertility control. First, he must be aware of the existence of some sort of contraception (not necessarily further specified) which a couple can use to decrease the chances of conception. Secondly, he must know that there exist ways of interrupting a pregnancy (induced abortion), and it can be explained that a lay person can carry these out, although at a considerable health risk. Finally, he must understand that

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[1]One high school senior responded on a post-questionnaire after playing Planafam, "If the game is a true representation..... of the life of these people, then I've learned a feeling say that other people have toward life unlike my own."

sexual separation, or abstinence, can be a way of avoiding pregnancy. We have found that even junior high school students have acquired sufficient information to cover these points. The teacher does not need to explain any of these topics further, although many may want to elaborate on these topics more during discussion. The teacher sets the tone here in introducing new material and information about conception and birth control.

Conceptual Basis

Besides this background knowledge, the player must grasp the rules of Planafam, and what it represents. A single, complete game play represents the lifespan of the Indian couple from the time the wife is 15 until she is 44. The game always begins at age 15, shortly after the wife's menses begin and the usual age of marriage in the rural Punjab villages, and continues without the death of either partner until age 44, when the wife is assumed to be no longer fertile (menopause). The partners may not divorce, and nor provision is made for infidelity, economic perturbations, changing customs, new birth control techniques, etc. Any or all of these topics may arise as discussion points, but for simplicity and clarity have been omitted from the game itself. They can be discussed in greater

or lesser depth if the teacher wishes.

In traditional Punjabi society, as in most other human societies, the average actual fertility of couples is below the maximum possible fertility for human beings. Families live on the poor farm land for generations, with inheritance of property through the male line. The girls of a family usually marry men from other villages, and go to live with the husband's family, taking with them a dowry. Support for the elderly is provided by their grown sons. The infant and child mortality rates are high. These circumstances, along with religious and social values, lead to a desired family size below the maximum -- 3 boys and 2 girls is considered ideal. There are enough children so that some will survive to adulthood, but not so many that their support is impossible. There are sons to work the land, to provide their parents in their old age, and to carry on the family name, but not so many that the farmland must be split into unworkably small parcels. There are daughters to help with the household tasks, but not so many that the family becomes dowry-poor when they marry and leave.

The available means of any control of human fertility fall into four groups:

1) controls on sexual intercourse - age of marriage, premarital abstinence, polygamy or monogamy, sexual separation, incest taboos, illness of adults, etc.

2) controls on chance of pregnancy -- various forms of contraception, frequency of intercourse, etc.

3) controls on pregnancy outcome -- prenatal care, miscarriages, induced abortions, etc.

4) controls over the offspring becoming a person -- infanticide, child neglect or abuse, infant and child mortality.

Examples of all four of these means of fertility control are included in Planafam. Sexual separation, simple contraception, and induced abortion can all be chosen by the player to attempt to control the fertility of the Indian game couple.

Entry into the pregnant state is a biologically determined random event, the probability of which can be influenced by the use of contraception or sexual separation to control fertility. The outcome of pregnancy can be determined by choice -- induced abortion -- or by chance -- birth of a live child of either sex, or "stillbirth," a composite of spontaneous abortion (miscarriage), stillbirth, and neonatal mortality in this game. These probabilistic events, conception and outcome of pregnancy, are controlled by a set of cards, the Fertility Deck. One other important random event is included in the game -- the death of

children, controlled by a second deck of cards, the Fate Deck. There is no provision for infanticide, although the possibility is usually discussed by the players. The amount of actual infanticide in the Punjab is not known, although the high mortality rates suggest that there may in fact be some.

For the sake of simplicity, several factors influencing the fertility of real populations, such as changing age of marriage and maternal deaths, have been eliminated in the game. Their existence and possible effects, however, can be discussed during or after game play.

Implicit Prices

Essential to the role-play appropriate for the Indian village situation are the positive and negative numbers in each space on the board. These are so-called "implicit prices" -- indicators of the relative value of various events to a typical Indian couple. They are based on very detailed information[2] collected from persons living in a number of villages in the Punjab during the 1950's, before the introduction of any government birth control programs. The numbers are not in money units, but reflect a composite of economic, personal, and social val-

[2]John B. Wyon and John E. Gordon, The Khanna Study: Population Problems in the Rural Punjab, Harvard University Press, Cambridge, Mass., 1971.

ues for an average or typical person in the society.

For example, the value of a new child in a family with no children is different from that in a family with six children already. In the latter case, indeed, the couple may accept the dissatisfactions of coitus interruptus or even abstain from sexual relations rather than risk the seventh pregnancy. The negative value of the child in this instance is greater than the negative value incurred in avoiding conception.

The implicit prices for a particular couple will reflect both societal pressures and individual preferences. A decision made with regard to reproductive behavior will be related to the relative values of the possible outcomes of the decision, as well as to the probability of each outcome. Chance is involved, for instance, in timing of conception, effectiveness of contraception, sex of offspring, and mortality of children.

Each person has his own values, and the variation of personal desires around social norms has been incorporated in the simple numerical values on the gameboard. Playing as if the numbers on the board reflected the player's own relative values gives results similar to those actually observed in the Indian villages. However, personal preferences and beliefs, and cultural differences between India and the United States

(which itself is very heterogeneous), will emerge during game play, and students should be encouraged to think about them. "Do you think everyone in the village would feel exactly the same?" "Is there likely to be more agreement among the Indian villagers than among us, and why? What does it mean?"

How to use Planafam

Like most educational games, Planafam is best used in a broader educational context, consisting of introduction, game play, and guided discussion. The introductory period may be a whole course in itself, or no more than a 15-minute explanation of the rules of the game. The discussion of the game, which actually begins during game play, can be treated as an isolated unit, or preferably, integrated into further explorations of topics related to the role-play experience.

After the section an game rules, we suggest several broad objectives for which we believe Planafam might be used. Where the game fits into a particular curriculum and how many sessions are spent on game play, discussion, and other related activities is the decision of the individual teacher.

Before you take Planafam into the classroom, play several games yourself, or preferably with a few other onlookers to act as kibitzers, in order to get the feeling of the game. It is

basically a solitaire game, and you could play it alone, but the educational and role-play values are much enhanced if you play as part of a small group of people, who are cooperating in helping you reach decisions as you play, and who comment on events in progress.

Teacher's Role

We have found Planafam to be most successful if, while several games are being played, the teacher functions as a roving provoker of discussion, asking questions, making brief thought-provoking remarks, commenting on student's reactions. For this reason, it is helpful to observe before you enter the classroom situation how various people react to the game, what strategic comments to make, and how your remarks might best be phrased to provoke discussion. We have tended to use the following sorts of comments with players:

"Are you sure that's what you would really do if you were an Indian man (woman)?" -- if the player seems to be following his personal values to the exclusion of any consideration of the Indian setting.

"What if this were your own life?" "You've been home visiting your mother for a long time..." -- if, on the other

hand, the player is following the game numbers to such a degree that his role-playing is impaired by counting points instead of children, cards instead of months.

"Is there anything else you might want to do which you

haven't considered?" or "Do you want to change your mind?" -- to increase variety of options explored.

"But one of your children may die....." -- to suggest one of the reasons that Indians do desire large families.

"How much longer do you have to go on this way?" -- to draw attention to the length of the reproductive life-span -- 30 years -- for which one must plan.

The game rules are much easier to understand if the game is being demonstrated and the rules emerge as comments on the actual cards as they turn up. That is the way that you will probably want to introduce your students to the game play -- by seating one of them at the board, the others gathered around, and explaining what to do and what it means as the game progresses. By forcing a variety of strategy - choices during this sample game, verbalizing freely, and inviting students to join in decision-making even during the demonstration, we have found that players are encouraged to enter active role-play themselves later. When enough has been demonstrated to give the idea of the game, brief mention can be made of other possibilities which may not have taken place yet (such as death of children), some of the students can be left in the original group to carry on by themselves, and other groups can be formed to start their own

"lives."

The instructions for Planafam and complete directions for making one's own game board are included here. As you play the game, you will find that the rules actually are much easier than they appear on paper.

Materials

To prepare a copy of this game for use, you will need:

1) a large piece of paper or cardboard, roughly 2 - 3 feet

2) marking pen (or the like)

3) three 52-card decks of ordinary playing cards (Two may be identical decks; the third deck should have a different pattern or color on the back side so that the cards of the Fertility Deck may be distinguished from those of the Fate Deck).

Draw and label the game board according to figure 1.

The game board shows that as the cards are turned up, they are to be placed in two piles and five rows. The Unprotected Intercourse (UI) and Simple Contraceptive (C) piles will contain cards representing cycles when the wife is menstruating normally. The former is for periods when no contraception is used, and the latter when relatively ineffective devices and practices are used.

The C-state is often a less satisfactory state than the UI-state and a psychic cost of one-fifth of a cowrie[3] is assigned to each card in this state. The S-row is for periods of sexual separation. It too is commonly less satisfactory than the "natural" UI state, and the cost of remaining in S-state increases disproportionately with the length of time spent in that way. The A-row records induced abortions and psychic cost of each increases as the total number increases. The D-row represents deaths of children. There are likely to be several of these because mortality rates are high. Each death including stillbirths has a psychic cost of one cowrie -- while the death of a child may be emotionally painful, it does not seem to change the fertility behavior of a Punjabi much.

The B-row and the G-row show the numbers of boys and girls at various stages of family growth. The utilities (cowries) of each boy and girl by birth order in the completed family indicate that an Indian has a strong preference for boys and also that beyond a family size of five or six the utility of additional children, especially girls, drop rapidly.

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[3]The numbers of the scoring system denote the psychological implicit prices previously described. The cowrie, a primitive form of money, is taken as the unit of value.

The remaining value parameters (in rows S, A, D, and pile C) in the game pertain to psychic and monetary costs of preventing births. In absence of modern techniques of contraception and abortion, these costs may be substantial. However, they must be met to prevent even greater penalties associated with excessive family size. Therefore, a balance is made between costs of fertility control and family size, and the usual result is a larger family than would be planned if costs of fertility control were negligible.

From one deck of cards, remove the aces. Shuffle this deck and set it to one side of the board -- it will be referred to as the Fate Deck.

Shuffle the other two intact decks together. This is the Fertility Deck. Place them before you on the table at the bottom of the game board.

Each of the 104 cards in the Fertility Deck represents a time period of 3.5 menstrual cycles; when all cards have been turned up, 29 years will have elapsed, and the reproductive period of the woman's life is over. This is set to span ages 15 to 44. The number of children surviving at that time and the number of each sex will depend on three things: the player's ideal family, his skill as a strategist, and chance.

As each fertility card is drawn, it is placed on the board in the space representing the woman's particular state for that 3.5 month period. Mortality cards are turned up according to the rules explained under Mortality.

Rules for Planafam

There are four modes of playing the game: Unprotected Intercourse, Contraception, Abortion, and Separation. Each pertains to a particular tactic. Mode UI is used in achieving a live birth in a short time; in mode C folk contraceptive practices are used, and the average time interval preceding conceptions is increased; mode A is used to achieve an induced abortion and is used when the costs of additional births or periods of separation are high; and mode S involves separation and is deployed when costs of additional pregnancies are high. The player can change modes at will at appropriate times during the game. After any period of separation, contraception, unprotected intercourse, as long as the woman is not pregnant, the mode can be changed. Modes can also be changed after births, abortions, or deaths. Any change in mode must be announced by the player; otherwise the previous mode is continued.

Mode C; contraception

"Contraception," as used here is coitus interruptus (withdrawal) and other crude contraception techniques which make pregnancy less likely. A cost of 0.2 cowrie is associated with each card (3 1/2 months) played in mode C. Mode C is played in the same manner as Mode UI, with the cards placed in the C-pile until the appearance of a P-card. However, in the mode of Contraception there are fewer P-cards and conception occurs less frequently. Only ace and two constitute P-cards; hence, the probability of conception during any period is only 2/5 that of mode UI. Draw five cards for the pregnancy. The outcome of pregnancy again is a male or female birth, or a stillbirth, and these cards are placed in the appropriate row. It is possible to switch from mode C to mode UI or S at any time except during a pregnancy.

Mode A; Abortion

Induced abortions are performed by lay women using crude techniques and under unsanitary conditions. The increasingly negative costs of subsequent abortions reflect the health hazards involved. This mode can be chosen whenever an unwanted pregnancy occurs (a P-card turns up during UI or C periods), in

order to terminate the pregnancy. After the P-card appears the next card must be placed in the A-row to represent a time-period of 3.5 months of infertility associated with an abortion. At the end of this phase, the wife is menstruating again, and a new mode of play is selected.

Mode S; separation

"Separation" refers to sexual separation (abstinence) as well as to the physical separation which would result if, for example, the wife were to pay a long visit to her mother's home, or the husband were to go away to work in another village. The rules for this mode are simple. Cards drawn from the deck are placed in the S-row. Any number of cards may be played in this way, and there are no P-cards. A shift to any of the other three modes may be made at any time. However, as in other modes, all cards placed in the S-row must be examined to conform to mortality rules. The grouping of S-cards into piles of five is merely for convenience in scoring. The first 5 cards (15 mos.) of separation have a negative value of 0.7 cowrie each; the next 5 cards, 0.9 cowrie each; etc., the longer the couple is sexually separated.

Mortality rules

The auxilliary deck of cards called the "Fate Deck"is used. It is an ordinary deck with aces removed, shuffled and placed face down at one side of the board.

Each card drawn from the original (Fertility) Deck of 104 cards is examined as it is drawn to ascertain whether it is a high spade---Jack, Queen, or King. High spades are a warning of the possibility of death ("epidemic in the village") for one or more of the children. Everytime a Jack, Queen or King of Spades is drawn from the Fertility Deck in the normal course of play, the top card of the Fate Deck is drawn and examined. The number shown by this card denotes the death of any child in the B and G rows with this same number. For example, if the card drawn from the Fate Deck is the three of diamonds, then any and all boys in the B-row showing the number three of any suit die and their cards are transferred to the D-row. Similarly, a Queen drawn from the Fate Deck means death to any girls in the G-row denoted by Queen cards of any suit. With three cards assigned to "high spades" the probability that a child will survive to age fifteen is approximately 0.8. In some games more than half of the children will die before the family

is completed. When one child-pile is moved due to death, subsequent children of the same sex are moved up the birth order column.

Strategy

In the early phase of Planafam, while the Indian couple have few children, the player's objective is to try to obtain a family of optimal size and composition (3 boys and 2 girls, as the implicit prices on the board indicate).[4] Modes UI and C are used, UI for a quick conception, and C, to delay conception somewhat. After four or five children are born to them, or less if the children are all of one sex, the value of additional children is low, or even negative. The player then tries to postpone or avoid addtional children, by using a mixture of C, A, and S. Use of any one means of fertility control exclusively tends to

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4. We introduce Planafam play in this way: "To play game, imagine yourself as an Indian. You and your young spouse are just beginning your life together, and you are under considerable pressure from your family and friends to have a child right away. You probably will want to start with no protection (mode UI)."

5. The anticipated "cost" of an additional live child, which might be either sex, is = (1/2 x value of next boy) + (1/2 x value of next girl), where the chance of having a boy or a girl is equal.

be more "costly" than using a mixture of three.

At any phase of the game, an optimal strategy choice indicates that the least-cost alternative would be best.[5] This disregards, however, the psychological meaning of the game to the player, and his willingness to take risks - he may want to try for a first son, after several daughters, despite an anticipated negative value from an additional live birth, because he feels a son is worth taking the chance.

The larger the couple's family, as the implicit prices indicate, the less likely it is that the player will wish for additional children, and the more likely that he will try to avoid conceptions. Deaths of children, however, can induce a change of strategy at any time by reducing the family size, and even making an additional birth desirable.

The implicit prices provide the framework for the cultural setting of the game--they embody the values of typical Punjab farm families. In using Planafam with American high school students, the teacher must decide to what extent cultural accuracy is important (as when one is trying to generate a sample of demographic data), and balance that against the loss of emotional role-playing which occurs when numerical calculations are foremost in the decision process. For the Indian role-play

5 (footnote on previous page)

to have validity, however, the implicit prices must be referred to at least casually, and strategic decisions which go counter to considerations of these values should be discussed in that light, as they illustrate the conflict between the players' own values (implicit prices), and those of the Punjabis. In general, role-playing seems to be most powerful during the first several times an individual plays Planafam; with repeated plays, numerical considerations come to dominate strategy decisions.

Rules for Termination

When six or more cards in the Fertility Deck remain to be played, any one of the four modes may be selected and the next phase played out. However, if five or less cards remain to be played, completion of pregnancy is impossible and all remaining cards are placed in the UI-pile (zero cost and the game concluded. Pregnancy cannot be indicated by these last 5 cards. These cards must, nonetheless, be examined for high spades.

Scoring

A tally sheet can be used to record the demographic events: number of boys, girls, deaths, abortions, and the number of periods spent in modes C and S. The overall game

score can also be determined by summing the costs and benefits (implicit price values on board) associated with the various demographic events, and the score recorded. Using an optimal strategy, the average game score is zero, but the variation of scores is wide, even with an optimal strategy, because the chance element is so strong under these reproductive and survival conditions.

Incorporating Planafam into the Curriculum

Broad Objectives

From our observations, we distinguish four broad goals toward which Planafam may be useful with high school and college age students: population dynamics, personal awareness, cultural awareness, and birth control counselling. These categories overlap to a considerable degree, but we describe them so that the teacher can sense the range of use of Planafam.

Population dynamics units usually include attention to basic demographic terms and concepts.[6] However, they often

6. Population and Society, by Dennis Wrong, a paperback book published by Random House, is one of several good introductions to population which the teacher might use for himself.

neglect the relationship between individual reproductive behavior and mass phenomena. Planafam can be used to help make this connection. The reproductive behavior of a single hypothetical Indian couple can be examined to consider the effects of social and technological factors on their fertility. By using multiple Planafam games to generate a "village" of couples, one can study the demographic characteristics of a group of such couples; the demographic statistics generated by a large number of Planafam games are nearly identical with those actually found in the rural Punjab region of India.

Personal awareness covers matters more closely related to the student's own life and his personal development. It includes insight into personal motivations and uncertainties, and the development of capabilities such as empathy, long-range perspective, sense of mastery, and responsibility. This is a very general category, but personal development has been included among the interests of formal education in many communities. During Planafam play and discussion issues can be raised which are of relevance to the student's life.

Increased cultural awareness means having a better

feeling for what it would mean to be a person in another society, with different values and different expectations of life. One's interpretation of the meaning of events and anticipations for the future are colored by one's experiences and learning in a specific cultural framework, which may be totally invalid in another setting. Understanding of a person in another society might be used to introduce ways of trying to understand other people within our own society, some of whose values and perceptions may seem quite incomprehensible at times. As a role-play experience of life in another culture, Planafam can be used to initiate exploration of the relationship between individual and his society.

We do not anticipate that many high school teachers will wish to engage in extensive birth control counselling, but Planafam can be used to demonstrate the need for fertility control in the average person's life.

Procedures Using Planafam

A number of variations on the use of Planafam will be described here which might be used to implement specific objectives falling into the four broad categories above. A combination of uses, or some entirely new ones, may be preferable in a particular context.

Repeated play of Planafam without any use at fertility

control modes gives a good estimate of potential human fertility. The effect of high infant and child mortality in restricting population growth rate emerges. This uncontrolled situation can be compared with the biological reproductive capacity of other animal species, and the results of natural controls on animal populations.

With few exceptions, human social groups take measures to restrict their fertility below the biological maximum. Some of the ways in which this is done are incorporated into the game -- contraception, abortion, sexual separation. The implicit prices indicate how the social and economic values of their traditional society lead Punjabis to utilize these various means of fertility control. The significance of the social influence on average individual behavior can be illustrated in Planafam by raising for discussion such issues as how variability of game outcome might be decreased, how average completed family size might be changed, and how changes in implicit prices (values) would affect family composition. The demographic results of modern medicine and technological change can also be traced. For some such proposals, see Table 1.

These measures for adjusting human fertility to social and environmental changes can also be related to historical examples, traced in their effects over generations -- the Irish

potato famine, the American frontier, the 1930's Depression and World War II -- to bring the theoretical fertility control options into perspective with actual events.

The collected results of a series of plays of Planafam can be used as the basis for calculating for a hypothetical village birth rates (net and gross reproduction rates), death rates, sex ratio, generation time, and per capita income (assuming, say, a fixed total farm income from one generation to the next, but a changing population size).

One can begin to look at the relationship between fertility desires of the students themselves and what the next generation they produce would be if their present ideals were met -- size, sex ratio, spacing. This transition from the Indian's desired and accomplished fertility to their own works easily, and comes as a big surprise to many high school students. The significance of their collective fertility desires can then be discussed in ecological, social, or other terms relevant to the interests and background of the students and the purpose of the course.

To increase the value of Planafam as a representation of the Indian experience, some societally descriptive materials can be used before the game is played to enhance the atmosphere.[7]

7.(a)"A Baby is Born in the Punjab," a short narrative article by Helen Gideon, published in American Anthropologist, vol 64, pp 1220-1234, December 1962. This story of a young bride is based on the same study from which the basis of Planafam derives. (b) Behind Mud Walls, a paperback book by William Wiser, (c) Village Life in Northern India, by Oscar Lewis, a village Giant paperback.

With cultural role-play objectives in mind, Planafam can be briefly introduced and played two or three times -- not more -- initially. Discussion should focus on the student's own reactions to the events of the game, and whether their feelings might also be true for an Indian villager.

The other students in a group can be encouraged to invent arguments, based on their readings, to encourage the player to adopt certain strategies. Large-family arguments, for example, might include "the children may die," "a daughter is such companionship for her mother," "don't you miss your family now that you've been separated for so long?" This helps introduce a variety of viewpoints into the discussion.

The basis for a fatalistic view of life, common in traditional societies, is evident in Planafam. The player, like the Indian villager, has relatively little control over the outcome; chance, in the form of conceptions and deaths, intervenes frequently. The implications of this fatalistic view on a culture can be discussed further -- what is the perceived relationship between man and nature? What role does religion play in a person's life?

In small groups, the students might devise ways of describing the unpredictability of Indian life as represented by Planafam outcomes. Bar graphs can show distribution of family sizes,

numbers of boys and girls; scatter graphs, the relationship between game scores and family size; percentage calculations, what proportion of players achieved their family size and composition goals.

The sources of variability in Planafam outcome are biological (chance), and individual (choice of strategy). Modernization introduces greater options for control over the chance factors of birth and death, making the outcome of life more dependent on the individual's values and strategy choices. How does this relate to the student's view of their own lives and futures? What do they see as their responsibility? What assumptions do the students make about the world and their roles in it?

Some questions which might be raised for discussion following Planafam play are:

--How does this increased control option relate to your view of your own life and the future?

--To what extent is this sense of control real? Is there as difference between control over one's own life, and control over larger events?

--What assumptions do you make about yourself, your world, when you think about the future?

--Of what value is planning for the future?

--Is control in one's life desirable?

--Do certain short- and long-term goals conflict in the student's own lives? (The content here is very much dependent on the teacher and the student group).

--How are one's preferences formed, how influenced by own experiences, acquaintances, society? An example for discussion here might be a decision to have no children -- how is it made? Accepted? Are these reasons valid?

--How do personal decisions affect society?

The time span over which population dynamics operate is a very long one. This presents a problem in trying to relate population changes in terms relevant to a young person -- a generation is 25 to 30 years, longer than a high school student's whole life to date. Additionally, teenagers are only beginning their own reproductive years, and many decisions about responsibilities are not anticipated. We find that time-span awareness has been increased for many players of Planafam; they ask "How many years until menopause?" "How old are my children now?"

For use in focusing more realistically on the player's own future, we have developed a modified version of Planafam which can be used to simulate more closely life in the United

States. The infant and child mortality rates are lowered, more contraceptive options included, and most significantly, it is possible to trace the reproductive span over time. This feature makes it possible to tie reproductive plans to one's other life plans at any age. We do not have space to present this version, Planafam II, here, but it will be published subsequently.

Using Planafam II, the students can try out hypothetical futures for themselves, modifying such features as age of childbearing, space of offspring, and contraceptive choice.

Time-span awareness is also improved by the visible time-trace of the 30+ years of reproductive life which each student faces. To further enhance perceptions of time spans and long-term consequences of decisions, a sequence of explorations of this sort, altogether taking about a week, might be used:

--what decision(s) did you make last week which will affect what you do next week -- such things as dates, work and school commitments?

--look at some decisions you or your family made during the last 5 years -- how will they affect you during the next 5 years? How do they affect you now?

-- look at your parents' generation, their collective decisions about life-style, about family life, about childbearing...how

do they affect you, your older sibs, your younger sibs? How do they affect your schools, your community, your nation? How long will this influence extend in time?

-- look now at some of the decisions you postulate in your future as you played Planafam -- what might their long-term consequences be? How well can you envision the future, and to what extent do you make the future?

In conclusion, we hope that many teachers will find Planafam of use in their classes, for population or other education. We would appreciate any comments you might like to make to the author.

The author would like to acknowledge the contributions of Dr. Charles Neave and Dr. Harold Thomas, Members of the Harvard Center for Population Studies, and the interest and support of Dr. John C. Snyder, Medical Director of the Center. The work was supported in part by a grant from the Rockefeller Foundation.

Table 1.

Possible Modifications of Planafam Reflecting Certain Social, Economic, and Technological Changes:

1. Reduction of mortality

   (a) child mortality -- reduce number of cards defined as "high spades."

   (b) "stillbirths" -- use fewer cards (i.e., not all aces) to indicate miscarriages, stillbirths, and infant mortality.

2. Relaxation of penalties and restrictions associated with induced abortion

Reduce costs associated with abortion (mode A).

3. Improvement of contraception techniques

   (a) as to efficiency, reduce number of P-cards in mode C.

   (b) as to acceptability or cost, reduce cost per card in mode C.

4. Legislation increasing age of marriage

Reduce number of cards in Fertility Deck.

5. Creation of non-familial economic opportunities

Reduce cost of separation (mode S).

Modify implicit prices (values) of boys and girls.

6. Increase frequency of intercourse

Increase number of P-cards in mode UI.

7. Switch from breast-feeding to bottle-feeding infants

Reduce number of cards associated with infertility after delivery.

8. Shift in ideal of family size and compostition

Modify implicit prices of boys and girls. For each sex there are three different types of modifications possible:

(a) change scale: multiply all numbers by a factor of greater (or less) than one.

(b) change number of "wanted"children (those having positive values)

(c) change difference between successive children of same sex to alter penalties associated with large families.

These are examples of how these changes might be represented in the context of the game. Discuss them with reference to Planafam. Do not change the numbers on the game board -- the implicit prices are actually interrelated in subtle and complex ways. Any price change which was not mathematically consistent with the rest of the game structure would invalidate the game as an accurate representation of the Indian demographic situation.

Figure 1

SEXUAL SEPARATION	ABORTION	SIMPLE CONTRACEPTION	BOYS	GIRLS	DEATHS
5 CARDS at -0.7 each	1st -4	-0.2 PER CARD Pregnancy = A, 2	1st +12	1st +8	1st -1
5 CARDS at -0.9 each	2nd -6		2nd +9	2nd +4	2nd -1
5 CARDS at -1.05 each	3rd -8	UNPROTECTED INTERCOURSE NO COST Pregnancy = A, 2, 3, 4, 5	3rd +4	3rd -3	3rd -1
5 CARDS at -1.6 each	4th -12		4th -3	4th -13	4th -1
ANY NO. OF CARDS at -2.2 each	5th -16		5th -12	5th -26	5th -1
	6th -20		6th -23	6th -42	6th -1

RISK OF DEATH: J, Q, K of SPADE

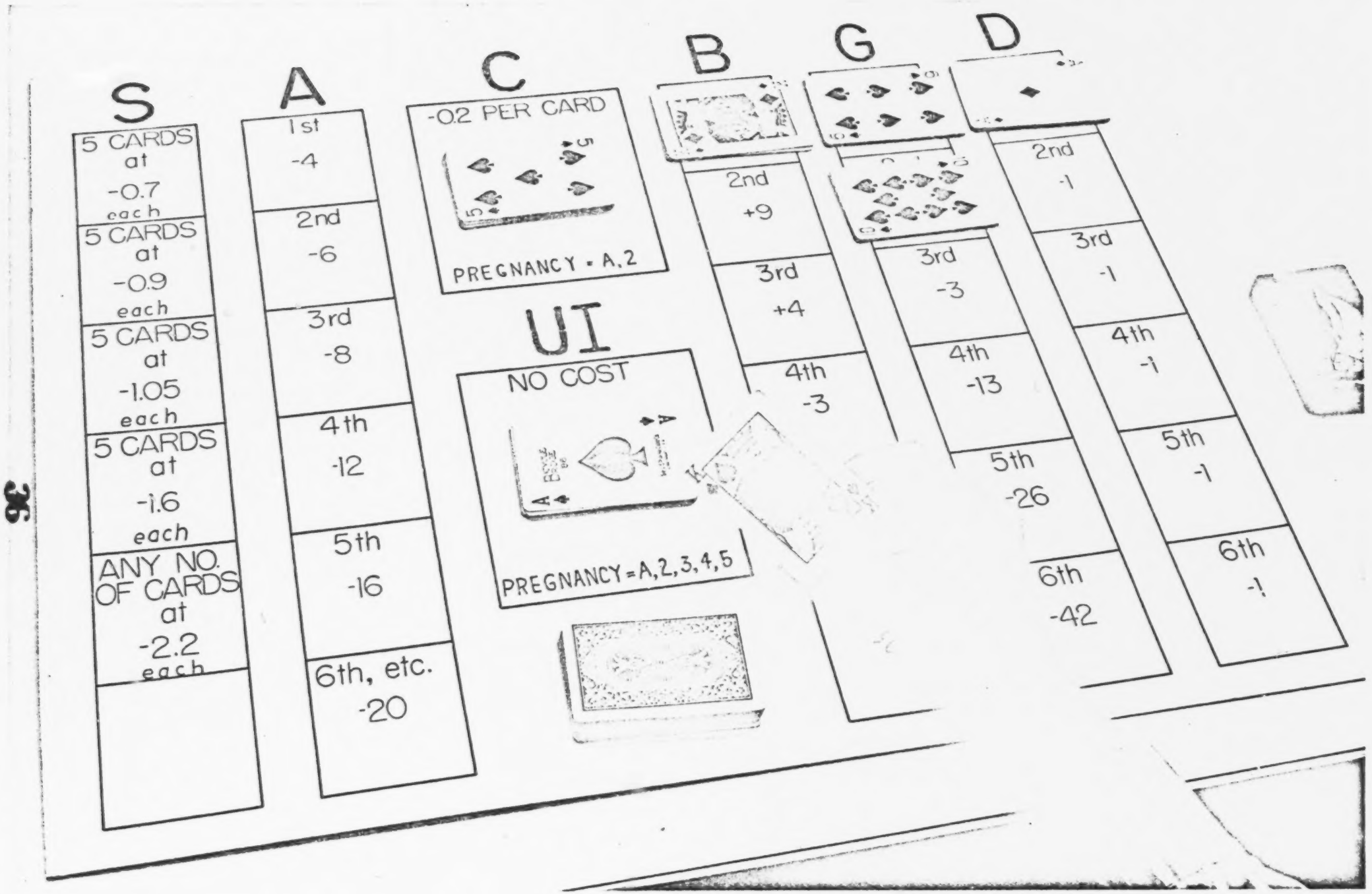
S
5 CARDS at -0.7 each
5 CARDS at -0.9 each
5 CARDS at -1.05 each
5 CARDS at -1.6 each
ANY NO. OF CARDS at -2.2 each
A
1st -4
2nd -6
3rd -8
4th -12
5th -16
6th, etc. -20
C
-0.2 PER CARD
PREGNANCY - A.2
UI
NO COST
PREGNANCY = A,2,3,4,5
B
2nd +9
3rd +4
4th -3
G
2nd -3
3rd -13
4th -26
5th -42
D
2nd -1
3rd -1
4th -1
5th -1
6th -1

Fig. 2

Illustrating the "illness" of a child in Planafam. The spade king in the player's hand was drawn from the Fertility Deck while mode C was being used. The player will now draw a card from the Fate Deck on the right. If the Fate card is a 6, 10, or King, that pile of cards corresponding to that child will be transferred to the D (deaths) column. The piles of cards already played show that while using modes UI or C the Indian couple have had 1 son, 2 daughters, and a "stillborn;" many years remain in their reproductive span.

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PLANAFAM II

A Game for Population Education

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PLANAFAM II
A Role-Play Game for Population Education

Population education materials are being generated with increasing rapidity as interest in this field rises. Most population education efforts to date have concentrated on fairly straight demographic presentations, on the assumption that once the facts about the present human population crisis are known, interest and responsible behavior by the students will follow. There is a large gap, however, between the demographic statistics of nations and the sorts of personal considerations which go into planning for one's own reproduction (or non-reproduction).

This paper presents Planafam II, a role-play simulation (loosely termed a "game") for use in population education programs. It is designed to help students and young adults span the gap between large-scale and personal perspectives, and to facilitate consideration of the factors involved in reproductive decision-making at the personal and family level.

Planafam II is a mode for anticipation and examination of one's own reproductive future prospects and options. Our objective with this exercise is to enhance self-understanding and rationality in reproductive decision-making -- to remove it from the realms of impulse and retrospection.

Biological factors such as probability of conception and miscarriage are fixed in Planafam II at realistic levels. Probabilities of divorce and separation of a married couple, and likelihood of death of a living child are based on United States 1960 census data. The personal decision factors are not fixed, however - the player is free to decide such matters as

preferred family size and composition, marital status, and means of achieving fertility control. In a heterogeneous society such as that of the United States, there is considerable latitude found in these personal choices. The Planafam II format permits this range of choice, but the interactions between group members during play of the game reveal some of the constraints present even in our social and economic system - education, career, family traditions, peer-group pressures, moral and legal restrictions. The Planafam II scoring system is crude and flexible, meant more as a guide to certain important considerations in reproduction rather than as a set of fixed rules.

PREPARATION OF A PLANAFAM II PLAYING SET

To prepare a Planafam II playing set, one needs:

-- a piece of stiff white paper or cardboard at least 26" x 30", for the game board on which the time course of a reproductive lifespan can be visualized. Cardboard is preferable for durability, paper for easy carrying.

-- 3 complete sets of double-six dominoes. Each domino represents a six-month time period during the reproductive years. Colored marks on the dominoes provide the major source of uncertainty in the game -- the probabilistic events which might occur during one's life to influence reproductive outcome.

-- 2 packs of ordinary playing cards without jokers. The cards are used in conjunction with the dominoes to give more accurate probabilities of chance events.

-- marking pens -- black, blue, green, yellow, red, orange. (Choose a blue and a green with different intensities for possible color-blind players.) The markers are needed for preparation of the game board and dominoes. Make sure that the markers you choose will color the spots on the dominoes, or use colored tape strips on the dominoes in matching colors.

--buttons or other colored markers to denote the occurrence of special reproductive events on the game board. At least 5 of each color are needed: we use blue for boys, pink for girls, white for spontaneous abortions (miscarriages) and deaths, and gray for induced abortions.

Draw and label the game board as in Fig. 1. Make each of the small spaces large enough to accomodate one domino. Color the NOT EXPOSED column blue; the NO PROTECTION column green; the GOOD CONTRACEPTION column yellow; the EXCELLENT CONTRACEPTION column orange.

A copy of Table 1 can be pasted on the board or kept at hand. The rules for the pregnancy period, (see later section), are written in the appropriate spaces in small letters.

The dominoes from all 3 sets are combined and marked as follows:

COLOR	DOMINO	
RED	4-4, 5-5	both ends colored red
YELLOW	6-4, 6-0 6-5, 6-6	6-end colored yellow
ORANGE	6-5, 6-6	other end colored orange
BLUE	5-1, 5-2, 5-4	5-end colored blue
GREEN	all dominoes with 1, 2, or 3 spots on either or both ends	color all 1, 2, or 3-spot ends green; those with both ends colored are for fairly ineffective contraception

To prepare for play, shuffle the cards and place them face down at bottom of the board. Shuffle the dominoes facedown, then line them up in the blue spaces. Some dominoes will be left over; set these aside without turning them up. This removes some of the possible chance events from the game, but which ones are removed is unknown, so that not even a player familiar with Planafam II can predict future events during the game.

INSTRUCTIONS FOR PLANAFAM II

Planafam II is a game of chance and of strategy. It offers the player a chance to live through a whole lifetime of a woman's reproductive experiences within a short time. The role to be assumed in the game can represent some hypothetical person, but it usually is taken to represent a female player's own present and future self, or a male player's

female relative, mate, or girlfriend. In this way, the role-player's decisions are personalized and offer a chance for greater emotional involvement with the outcome of the simulation.

For optimal discussion and learning, the role-player should be part of a small group of people (3 to 10) including a teacher or moderator. One person takes the role of the woman whose reproductive life provides the focus for the game. The other group members' function is to question the player's decisions as they are made -- their bases, the realistic or unrealistic nature of these decisions, other options available, other plans the player might envision for the future which could conflict.

There is no single "best" family size for the Planafam II role-woman. Rather, the player begins the game by choosing a preferred family size which will be the goal for the role-woman's life. Preferences as to sex of children, spacing, and age of childbearing are elicited by the moderator in order to determine whether the player has strong feelings about these matters. Other group members are encouraged from the start to discuss the player's goals, as well as his later decisions.

Regular playing cards and specially marked dominoes are used to mark the passage of time and to determine the randomly-occurring events of the woman's life. The player chooses a strategy to achieve her or his desired family. A crude scoring system (Table 2) is included in Planafam II to suggest one way in which the actual outcome of the game might be compared with the player's ideal plan for the role-woman's life.

This scoring system, like all the decisions in the game, is open for debate by the group. It is meant only as a guide to certain important considerations in reproduction rather than as a set of fixed rules.

The playing board (see figure) shows in linear fashion each of the years of a woman's life, starting at age 14, and ending at 50. Dominoes each representing six months of the role woman's reproductive lifetime are initially aligned facedown on the game board in the NOT EXPOSED TO PREGNANCY column. As time passes and the woman ages, the dominoes are turned up one by one. They are then placed in any one of the four parallel columns to indicate the woman's fertility state during a particular six-month period. The columns represent the states: NOT EXPOSED TO PREGNANCY, NO PROTECTION, GOOD CONTRACEPTION, and EXCELLENT CONTRACEPTION. When all the dominoes have been turned up, the woman has reached 50 years of age, and the game ends.

A double-deck of ordinary playing cards is used to refine probabilities in the game in two ways: (1) by confirming that an event, suggested by the domino turned up, has in fact occurred; and (2) by providing a finer time resolution, into three-month periods, for the periods of pregnancy, birth, and lactation.

In real life, a woman's sexual and childbearing state is determined partly by choice, and partly by chance. So it is in Planafam II. The number of spots and the colored markers on each of the dominos indicate whether an event has occurred during the six-month period rep-

resented by the domino which might influence the woman's fertility state. For an event to materialize, it must be confirmed by a card drawn from the deck. If a change of state is confirmed by the card, the domino for the following six-month period will be placed in accord with the new state. If the card does not confirm the possible event suggested by the domino, no significant event has occurred during the six months, and the player may choose a fertility state for the next six months.

GAME BOARD AND DOMINOES

The Planafam II game board shows that during a six-month period, a woman can be in any one of four fertility states: NOT EXPOSED TO PREGNANCY, NO PROTECTION, GOOD CONTRACEPTION, or EXCELLENT CONTRACEPTION. The player's choice determines the role-woman's state unless chance factors override the player's preference. Refer to Figure 1 for a diagram of the game board and to Table 1 for a summary of the significance of marked dominoes and their confirmation cards.

In greater detail, the fertility states are:

1. NOT EXPOSED TO PREGNANCY (N-E) - BLUE COLUMN. While in this state, a woman may not be exposed to pregnancy for any of the following reasons:

a. The woman will not yet have begun having sexual relations.

The player decides initially at what age sexual relations will begin, and plays all dominoes face up in the N-E squares up to that age on the board.

b. The couple voluntarily abstains from sexual relations for any number of six-month periods. This is a voluntary choice of N-E state made by the player, which can be ended by the reverse choice at any time.

c. The woman leaves her mate. This decision is made at the player's discretion, but finding a new mate is not. Once she has left her mate, the woman can leave the N-E state only if she meets another suitable man. The woman continues to be in the N-E state until this chance event is indicated by turning up a domino with a blank end, at which time she can become sexually active again.

d. Social conditions of a not purely voluntary nature may prevent sexual activity. These include such phenomena as separation, divorce, widowhood, breaking-up-with-boyfriend, work-dictated separation, etc. Medical problems of the woman or her mate can also prevent intercourse or result in infertility. Any such possible conditions which would result in involuntary entry into the N-E state are indicated by drawing a card which is ace through 10 of diamonds. This involuntary, chance-determined non-exposure to pregnancy can be interpreted as any phenomenon appropriate to the role-woman's age and status, such as having a young

woman's boyfriend enter military service, or a woman develop some medical complication following pregnancy. If the role-woman is not exposed to pregnancy for any involuntary reason, she can leave the N-E state only when another chance event occurs; namely, turning up a domino with a blank end, which indicates an end to the adverse condition.

e. The woman or her mate can have surgery (sterilization) to prevent future pregnancies. This is a voluntary choice of the player. If the woman has a sterilization operation, this is considered irreversible and all the remaining dominoes are played in the N-E column. If the man is selected to have a vasectomy, the remaining dominoes are examined for chance of change of sexual partner, since the woman is still capable of childbearing.

f. Finally, all dominoes are played in the N-E column after menopause. Menopause can occur by chance any time after age 38 and is determined by a blue-spotted domino followed by any ace through ten of hearts.

Whenever the woman leaves the NOT EXPOSED state, she is fertile, unless the couple is using a contraceptive to avoid pregnancy.

2. NO PROTECTION - GREEN COLUMN. While in this state, the role-woman is physically capable of becoming pregnant and is having sexual relations regularly. There are no medical reasons for her not

becoming pregnant and she is not using any effective means of avoiding pregnancy.

The player places the domino for a six-month period in the NO PROTECTION column if he decides that the role-woman is having sexual relations and has not drawn any dominoes which would indicate that she is in a different state.

The woman can leave the NO PROTECTION state at any time by the player's choice, going into the NOT EXPOSED state or going into one of the contraceptive states.

She also leaves the NO PROTECTION state if one of the following events occur:

a. A chance of involuntary non-exposure to pregnancy is confirmed. She then goes into the NOT EXPOSED state.

b. Pregnancy occurs. A chance of pregnancy for the role-woman in the NO PROTECTION state is indicated by turning up any domino with green spots (matches the color of the column). This chance can be explained as "a late period". Pregnancy is confirmed by then drawing an ace through ten of any suit. Turning up a face card means that the woman is <u>not</u> pregnant.

For the average couple, rhythm, douche, vaginal suppositories and withdrawal are all relatively ineffective means of fertility control. If the player wishes to have the role-woman use one of these means to prevent pregnancy, the domino is turned up in the NO PROTECTION column,

but chance of pregnancy is indicated only by those dominoes which bear green spots on <u>both</u> ends. The chance of pregnancy using one of these relatively ineffective means of birth control is 1/3 the chance if no contraception were used at all (i.e., it is 67 % effective).

3. GOOD CONTRACEPTION - YELLOW COLUMN. While in this state, the role-woman and her mate are using one of the following means of birth control: diaphragm (with cream or jelly), condom, aerosol foam. These are fairly effective (85%) in preventing pregnancy. Admittedly, highly motivated, conscientious people can achieve somewhat better contraceptive results with these methods than those postulated by the probabilities in Planafam II. However, the authors of the game feel that this variation in use-effectiveness should be discussed openly by the player and the group, rather than assumed to be understood.

Chance of pregnancy while using good contraception is indicated by a domino with yellow spots and is confirmed by an ace through 10 of any suit.

4. EXCELLENT CONTRACEPTION - ORANGE COLUMN. In this state the role-woman is using either oral contraceptives or has an intra uterine device. These methods are both postulated to be 95% effective by the Planafam II probabilities. Chance of a pregnancy while using excellent contraception is indicated by a domino with orange spots and is confirmed by an ace through 10 of any suit.

In the Planafam II scoring system, the player is penalized for use of excellent contraceptives for a duration exceeding 10 years within one lifespan (5 years pill, 5 years IUD). The available medical evidence is not sufficient for us to indicate in Planafam II a specific duration of pill or IUD use which might be considered "safe" from the standpoint of medical risk. Nor is it evident whether several shorter episodes of use may be less risky than one long continuous period. Consequently, the time limit is 5 years/5 years, in order to provoke thought as to the possible medical consequences of the use of these contraceptive methods.

The role-woman leaves either the GOOD or the EXCELLENT CONTRACEPTIVE state if:

a. The player decides at any time that the couple stops using the contraceptive. The woman can switch to another contraceptive in the same or another state or can enter either the NO PROTECTION or the NOT EXPOSED TO PREGNANCY state.

b. A chance event results in her being NOT EXPOSED TO PREGNANCY.

C. Pregnancy occurs. This can be discussed as either (1) user failure, a pregnancy which occurs because the man or woman fails to use the contraceptive properly, or uses it sporadically, thus diminishing its effectiveness; or (2) method failure, a pregnancy which occurs despite proper and consistent use of a contraceptive method, a failure of the method itself.

PLAYING CARDS

The double deck of playing cards is used in Planafam II for the following purposes:

1. To confirm chance of pregnancy. Ace through ten of any suit confirms that the woman is pregnant, after the appropriate domino, (green, yellow, or orange).

2. To confirm chance of involuntary non-exposure to pregnancy.

3. To confirm chance of menopause. Ace through 10 of hearts confirms menopause when a blue-spotted domino is turned up after age 38.

4. To confirm risk to the life of a living child. If a spade whose number matches the number on a living child's card turns up to confirm a red-spotted domino, that child dies. A gray death marker is placed by the child's marker. The red-spotted domino indicates risk at any time after there are living children, including during pregnancy and after menopause or sterilization.

5. To indicate certain events during the pregnancy period - miscarriage (spontaneous abortion), stillbirth, sex of child born, newborn death. The pregnancy period is further explained below.

PREGNANCY PERIOD

For the role-woman to become pregnant, a domino must be turned

up which indicates a chance of pregnancy ("late period"). This is a domino with spots the color of the column in which it is played (e.g., yellow spots if in the yellow column, GOOD CONTRACEPTIVE mode). Dominoes with green, yellow, or orange spots hence are capable of indicating chance of pregnancy. A playing card is then turned up to see whether pregnancy is confirmed. An ace through 10 of any suit confirms pregnancy. A face card means the woman is not pregnant.

If the role-woman <u>is</u> pregnant, the confirmation card also represents the first three months of pregnancy. Three more cards are turned up to indicate the second and third trimesters of pregnancy, and the first three months after birth. These cards are examined as they are played in the appropriate spaces on the board. If the pregnancy has not been interrupted in any way (see below for these possibilities), the third card (birth card) is set aside to identify the child, and the remaining cards are discarded.

Sex of child: Male children are indicated by birth cards with odd values (3, 5, 7, 9), Jacks, Kings, and red Aces. Female children are indicated by birth cards with even values (2, 4, 6, 8, 10) and Queens.

When a pregnancy ends in live birth, and the child survives the first three months after birth as indicated by the cards, the next two dominoes are stood on edge and the second one has a child marker of the appropriate color placed by it. (Blue for boys, Pink for girls) There is no provision for twin births in Planafam II, but the subject occasionally arises

in discussion.

Miscarriage, stillbirth, or neonatal death may be indicated by the cards turned up during the pregnancy. When the pregnant woman is less than 38 years old, any ace turned up during the first six months of pregnancy indicates a miscarriage (spontaneous abortion). A black ace during the last six months of the pregnancy period indicates a stillbirth or neonatal death. If the pregnant woman is more than 38 years old, the frequency of miscarriage, stillbirth and neonatal death rise. Hence, after age 38, any ace or two is a miscarriage, and any black ace or two is a stillborn or neonatal death.

If the pregnancy terminates within the first six months, one domino is turned up on edge. If the pregnancy terminates during the second six months, two dominoes are turned up. A white death marker is placed by the domino.

Abortion: If the player decides that the role-woman will terminate a pregnancy by induced abortion, this decision must be made within the first three months of pregnancy, immediately after the card which confirms pregnancy is drawn. No further cards are played, and the confirmation card is discarded. One domino is turned up on edge, and a gray abortion marker placed by it.

Since many of the same factors which might lead to nonexposure to pregnancy in a non-pregnant woman can also influence the life of a pregnant woman, the dominoes turned up to mark a pregnancy period

must be examined.

If a chance of non-exposure to pregnancy occurs (blue-spotted domino) and is confirmed, this takes effect with the next domino, whether the woman is pregnant or not, and continues until reversed by a blank-ended domino. Examples of interpretations of such an event are desertion of a pregnant woman, or medical problems of the pregnant woman's mate which might continue regardless of her condition.

Chance of menopause (blue-spotted domino) during pregnancy in a role-woman over age 38, if confirmed by ace through 10 of hearts, indicates that menopause occurs at the end of that pregnancy in progress.

If a red-spotted domino is turned up during pregnancy, possible death of a living child is indicated, and a card is drawn to confirm. The risk applies only to children already born, but does not apply to the pregnancy in progress, nor to the newborn during the first three months of life.

SUGGESTIONS FOR THE MODERATOR OF PLANAFAM II:

Planafam II's educational potential is heavily dependent on discussion between members of the small group who assist the player in making decisions, and on the relaxed, inquiring attitude of the moderator. The moderator can focus discussion on issues of particular relevance to the objectives of the context in which the game is played. He can encourage

further examination of decisions which are passed over lightly by the group, and can provide specific cognitive information when it is appropriate. We strongly suggest, therefore, that anyone planning to moderate Planafam II as an educational experience initially play the game himself several times with others, in order to become familiar with the timing and kinds of issues that arise during play.

Important concepts which begin to emerge during game play can and should be elaborated upon by other educational techniques. For example, discussion of sex preferences of children might be followed by reading and an exercise in which students devise and administer a questionnaire dealing with sex preferences. Depending on the context in which the game is played, it is equally possible to use Planafam II as an introduction to the meaning of demographic terms, to psychological considerations in birth planning, to religious and moral issues in reproductive control, or to contraceptive technology. Before the teaching sessions with Planafam II, select or prepare further educational materials to have ready as follow-up after the game and discussion periods. Educational games tend to generate enthusiasm,and a prepared moderator can capitalize on this heightened interest.

Consider the means of introduction of Planafam II to the group. If the total group size is small (up to a dozen), I (K. F.) usually begin by describing the general purpose of the game, showing the board, indicating the available list of rules. I pick a main player from the group by watching

for someone who has an interested expression, or by asking for a volunteer who would like to play her or his own life. This person then sits before the board, with the others around, while I coach them through the early phase of deciding preferred family size and composition, age of first sexual experience for the role-woman and her early marital status. There is generally some group anxiety aroused at this point, which can be discharged by a quick remark that the player can make-believe on this point, we don't expect any true confessions, but just to pick some reasonable beginning. The group members should now be somewhat prepared to work together in making decisions and trying to influence the player. One of the first points for discussion is usually whether a girl first beginning her sexual life (married or not) will have thought about whether and when she'd like children, and if a delay is contemplated, what kind of contraception the couple would use. I don't accept a facile, "Oh, the pill, of course," and if no one else in the group offers any comment, I ask someone whether he thinks a girl would be already on the pill from the start? Where would she get it? How far in advance would she have to plan in order to be prepared for her very first sexual experience? Is such planning ahead common among their acquaintances?

The functions of the moderator from this point on become, (1) occasionally asking probing questions to stimulate discussion of important issues, and (2) providing sporadic factual inputs when the group seems to need more information, or to have arrived at a point at which they could

recognize its significance in the game (such as a remark on increased incidence of mongolism among children born to older women).

In introducing Planafam II to a larger group (up to about 35), I usually begin as the player myself, having the group members make decisions for me while they all watch. After the first pregnancy (or earlier, if the pregnancy is delayed), I turn the player role over to one of the watchers, divide the large group into several smaller ones, and have each smaller group begin its own game while I rove around making comments on the games as they progress.

Several important themes which come up for discussion quite consistently during Planafam II are of particular importance from the population standpoint. We recognize that a teacher's manual which elaborated on these topics would be desirable, but outside the scope of this article. We simply list several of these themes here in order to stimulate thought regarding the potential relationship of Planafam II to other teaching materials.

Total number of offspring: desired family size vs. expected family size. Second or third marriages. Illegitimate births - do they count differently for the individual if the child is kept, or if it is placed for adoption? Does adoption as a means of having a larger family covertly encourage large-family norms? What pressures exist regarding large families, one-child families, the choice of non-child-bearing?

Timing of childbearing: Does timing of childbearing influence total number of offspring? How? Are there optimal years for childbearing? How does one define them? What are the effects of spacing of children biologically? Emotionally? Timing of reproduction as it influences relationships between husband and wife, with other family members and friends. What is a generation?

Sex of offspring: How important is it for the first child to be of a particular sex? To have at least one boy, or one girl, or one of each? Do these preferences affect completed family size?

Planning: Husband-wife communications about childbearing preferences, expectations. Motivations involved - for sex, for pregnancy, for mothering or fathering roles, for biological offspring. Investment in children vs. other options. Costs of raising children. Birth planning compared with other forms of planning - educational, economic. Is planning effective? Is there any moral issue involved in planning?

Choice of contraception: Advantages and disadvantages of different methods. Effectiveness. Duration of use. Safety. Reasons why contraceptive choice might vary with number of offspring, couple's age and status. Sterilization - pros and cons.

Deaths and Miscarriages: Biological factors in pregnancy wastage. Frequency of miscarriage, personal significance, family reactions to them. Impulse for replacement. Is possible death of a child seen as a real threat to the average American?

Abortion: What is its significance to the individual? Moral issues involved. Motivations for and against it at different points in a woman's life cycle. Safety. Experience with abortion in other countries, at other times, as a primary means of fertility control. Medical consequences of induced abortion .

Length of Reproductive Span: Pattern of one's life over time, and relationship of fertility behavior to other events of life.

Planafam II can be used alone, or in conjunction with a similar game called Planafam I, which is based on data collected in rural India during the late 1950's. The juxtaposition of reproductive options and constraints under different social and cultural circumstances through the use of both games adds another dimension to Planafam II as a device for population education.

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TABLE 1

Each domino = 6 months. Declare desired number of children and any strong sex-preference before play. Before age at which first intercourse begins, play all dominoes in blue column. Check for chance of involuntary sexual separation continuing past chosen age of first intercourse.

Mode of Intercourse:	Late period indicated by:	Confirmed by Card:
Unprotected intercourse	Any green-spotted domino	For any late period, draw one card. If it is Ace through 10 of any suit, the woman is pregnant.
Folk contraception (rhythm, douche, withdrawal, etc.)	Any double-green-spotted domino	
Good contraception (diaphragm & cream, condom, aerosol foam)	Any yellow-spotted domino	
Excellent contraception	Any orange-spotted domino	

Induced abortion can be chosen immediately after a pregnancy-confirmation card. Turn up one more domino and use a brown marker.

Other possible events:	Chance indicated by:	Confirmed by card:
Death of a living child	Red-spotted domino	Spade with same number value as one of living children's card
Involuntary sexual separation (can be due to illness, social or work problems, or death of spouse)	Blue-spotted domino	Any diamond, Ace through 10

Sexual separation continues until any domino with a blank is drawn.

Voluntary sexual separation may be begun and ended at any time by player's choice.

Menopause (only after age 38)	Blue-spotted domino	Any heart, Ace through 10

Voluntary sterilization may be chosen at any time. Play all remaining dominoes in blue column. Check for chance of death of living child.

TABLE 2: PLANAFAM II SCORING RULES

Before beginning play, state goals in terms of family size and sex composition. Your final score will be a measure of your success in achieving your optimal family.

Event	Score
Perfect family size and sex composition	100
If any of the following situations should arise during the course of the game, the amounts indicated at the right should be subtracted from the perfect score of 100.	
Each child too few or too many	10
Wrong sex of children, if strong sex preference exists (e.g., "I'd probably try again if I hadn't gotten a son")	5
Death of living child after first 3 months of life	10
Stillbirth or newborn death	5
Miscarriage in first 6 months of pregnancy	3
Induced abortion	5
Each domino (6 months) of NOT EXPOSED TO PREGNANCY after sexual activity begins	1
Each domino beyond twenty (20) of use of EXCELLENT CONTRACEPTION	1
Voluntary sterilization	10
Too close spacing: at least six months between pregnancies (i.e. another conception indicated by the first domino turned up after the end of the previous pregnancy - by whatever means it ended - is too close)	3

NOT EXPOSED TO PREGNANCY

NO PROTECTION

21 — 25 — 26 — 27 — 28 — 29 — 30 — 31 — 32 — 33 — 34 — 35 — 36 — 37 — 38 — 39 — 40

GOOD CONTRACEPTION

EXCELLENT CONTRACEPTION

PLANAFAM II

BOYS	GIRLS

CONFIRMADO CARD. FIRST 3 MONTHS	SECOND 3 MONTHS	THIRD 3 MONTHS	3 MONTHS AFTER BIRTH

24 — 1 — 23 — 1 — 22 — 21 — 20 — 19 — 18 — 17 — 16 — 15 — 14

NOT EXPOSED TO PREGNANCY

NO PROTECTION

GOOD CONTRACEPTION

EXCELLENT CONTRACEPTION

40 — 41 — 42 — 43 — 44 — 45 — 46 — 47 — 48 — 49 — 50

NOT EXPOSED TO PREGNANCY

NO PROTECTION

GOOD CONTRACEPTION

EXCELLENT CONTRACEPTION

BOYS

ANY ODD NUMBER, JACK, KING, OR RED ACE

GIRLS

ANY EVEN NUMBER OR QUEEN

IF CHILD LIVES, SAVE THIS CARD

BEFORE AGE 38: ANY MISCARRIAGE IN THIS MAY BOTH CONFIRM INDICATE EARLY

CONFIRMATION CARD - FIRST 3 MONTHS

AFTER AGE 38: ANY A MISCARRIAGE IN

ACE MEANS A SIX MONTHS, ACE PREGNANCY AND MISCARRIAGE.

SECOND 3 MONTHS

ACE OR 2 MEANS THIS SIX MONTHS.

FOR ANY MISCARRIAGE IN THIS SIX MONTHS

BEFORE AGE 38: MEANS A STILLBIRT IN THIS SIX MONT

THIRD 3 MONTHS

AFTER AGE 38: ANY MEANS A STILLBIR DEATH IN THIS

ANY BLACK ACE H OR INFANT DEATH HS.

3 MONTHS AFTER BIRTH

BLACK ACE OR 2 TH OR INFANT SIX MONTHS.

FOR ANY STILLBIRTH OR INFANT DEATH IN